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The Official Journal of the Rocks and Minerals Association

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Some Past and Present Glaciers of Colorado

By RONALD L. IVES

During the Pleistocene period, our geologic yesterday, great changes took place in North America. About 4,000,000 square miles of the continent were covered with moving ice, many great mammals became extinct, volcanoes became active in the southwest, and, toward the end of the period, man wandered southward from the Bering Sea area to the regions where living was easier.

In the higher mountain ranges, from Alaska south to Arizona, each major valley, with a few exceptions, had a glacier at its head. In Colorado, the effects of this glaciation are especially pronounced, and at least twenty of the Pleistocene valley glaciers have survived, greatly reduced in area, to this day.

Former Extent of Mountain Glaciation

During the Pleistocene period, glaciers in Colorado filled the upper portions of nearly all of the valleys which extended up to an elevation of 11,000 feet. These ice fields, of a number of square miles in extent, and up to 600 feet thick, united into systems, in a manner similar to streams, and flowed downhill to an elevation of about 9,000 feet, where the advance of the ice was offset by melting. Some of these valley glaciers were as much as 15 miles long, and had as many as five separate heads in different, but adjacent valleys. At least twice, these glaciers advanced to their maximum length, and twice they retreated to about their present extent. Some evidence, not verifiable from present data, indicates that there may have been more than two advances, but good evidence, capable of thorough checking, is available for only two advances.

Alpine glaciation during Pleistocene time is known to have occurred in the Front, Sangre de Cristo, Mosquito, Sawatch, San Juan and San Miguel Ranges in Colorado, and in the numerous minor ranges related to these main ranges, but carrying, locally, different names.

In the San Juan Mountains, the study of alpine glaciation has been complicated by the discovery of the Ridgeway Tillite, an Eocene bed containing glacially striated pebbles, by Atwood, Coleman and others.

Existing Glaciers of Colorado

Today, bodies of ice resembling glaciers in many respects can be found in all of the major ranges of Colorado. Only in the Front Range have any of these been definitely proven to be glaciers. Some of the bodies of ice in the other ranges are undoubtedly glacial, but definite proof awaits further study.

From the northern boundary of Rocky Mountain National Park south to the Moffatt Tunnel, there are a number of glaciers, some of them typical alpine glaciers, others "freaks," and still others in the "doubtful" classification. All of these have been more or less carefully studied, their rates measured or carefully estimated, and a more or less complete series of photographs of them, and their annual changes, kept.

In the absence of public funds for mapping and study of the glaciers, work has been carried on by the var-

ious mountain clubs in Colorado, by the faculties of various colleges, and by private parties, using their own funds.

Mechanics of an Alpine Glacier

In all typical alpine glaciers, regardless of geographic location, certain definite structural features are present, and a definite series of actions take place.

A typical alpine glacier occupies a valley in an elevated location, where the average annual snowfall is greater than the average annual melting. This, under present climatic conditions, occurs near the crest of a mountain range, and at an elevation of about 12,000 feet in Colorado..

Snow falls during the autumn, winter and spring,onto an inclined valley wall in a sheltered location. During the warmer months, the snow that does not melt or sublime slumps down the valley wall to a lower level, where it compacts into ice. When the ice **surface** becomes sufficiently inclined, the ice moves, probably by melting and regelation, to a lower level, and continues moving downhill until the advance just equals the melting. Here, rocks, gravel and dust, picked up by the ice in its journey, are deposited in front of the ice, and form the **moraine.**

The inclined valley wall, where the snow accumulates first, is called the névé field, and the accumulated snow the névé. Just below the névé is a gap, caused by the motion of the ice away from the valley wall, called the **bergschrund.** This is closed at times by slumping of the névé. Below the bergschrund is the glacier proper, composed of solid ice, with some rock, which was carried to it by the slumping névé, or which fell onto the ice from the valley wall.

At the front of the ice, there is a moraine, called the **terminal moraine**. At the sides of the glacier are small moraines, called **laterals.** If two glaciers meet, the moraine between them is called a **medial.** Between the ice and the terminal moraine, and sometimes underlain by ice, there is often a lake, colored blue or green. This is called the morainal lake, and the coloring, suspended rock dust, is called "glacier milk."

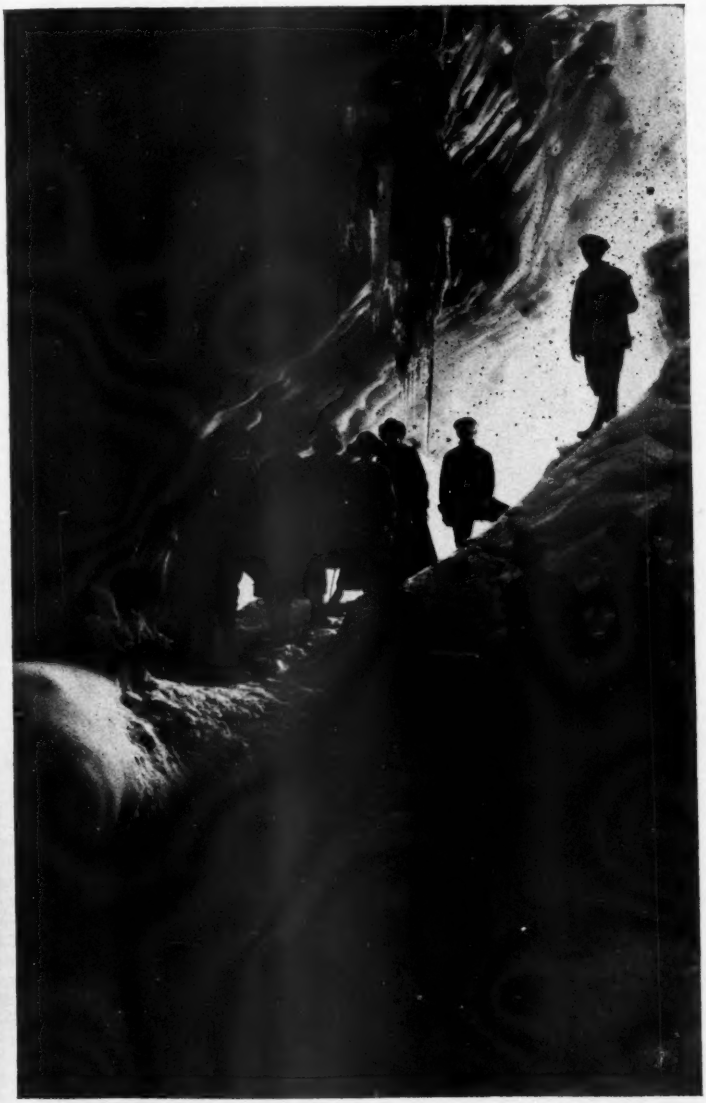
The upper part of a glacial valley from the top of the névé to the point where the ice is completely compacted and starts moving, is called the **cirque.** From the part of the glacier where the front of the ice takes on a definite slope, to the downhill edge of the moraine, is called the **melting basin.** The distance between cirque and melting basin may be many miles, but in the case of the Colorado glaciers, is quite short, being about one mile in the Arapaho Glacier, the largest and most typical. In the case of the smaller and "freak" glaciers, this distance is very short, the entire length of the ice mass being, in several cases, only a few hundred feet.

The Present Arapaho Glacier

The present Arapaho Glacier is the largest and most thoroughly studied of the alpine glaciers of Colorado. It is situated at the head of North Boulder Creek, about 50 miles northwest of Denver, and four miles from the nearest place where an automobile can be taken by an experienced mountain driver.

(Photo by Dwight Lavender)
Courtesy Colorado Mountain Club

The neve of a glacier. Here the snow collects, solidifies into ice, and later slumps onto the main ice field.



(Photo by George Barnard) The interior of a bergschrund Courtesy Colorado Mountain Club

The cirque is about one half mile in diameter, and is situated between South and North Arapaho Peaks. The rim of the cirque, and upper edge of the névé, is about 13,200 feet above sea level. The bergschrund is about 12,700 feet above sea level on an average. The ice field, about half a mile square, slopes from 12,700 feet down to about 12,000 feet. The moraine is half a mile long, 800 feet wide and about 250 feet high. The thickness of the ice has not been accurately measured. It is known to be more than 40 feet, as crevasses have that depth, and is probably not more than 250 feet, the height of the moraine, although it is possible that there is a pocket behind the moraine, which would permit a greater thickness for a portion of the ice.

There is a morainal lake at the junction of the ice and the moraine, which changes its size from month to month, and its shape from year to year. A number of years ago, this lake dried up, due to the moraine in front of it washing out. Three sides and the bottom were of blue glacial ice; the other side, through which the water escaped, was of mixed morainal material and ice.

Crevasses can be found in the late summer on the face of the glacier. There are two general types of crevasses—longitudinal crevasses, caused by the melting of the ice by streams of water which run over it, and transverse crevasses, caused by irregularities in the cirque floor. If a glacier moves over an irregularity, the ice is strained, and tends to split open. If the strain is greatest at the surface, an open crevasse may be caused, which resembles a V in cross section. If the strain is greatest at depth, it will tend to produce a crevasse of inverted V shape, and may cause a pressure-ridge on the surface. This type of crevasse is rather rare in the Colorado glaciers.

Although longitudinal crevasses seem to be generally caused by water running on the surface of the ice, theoretically, at least, they can be caused by unevenness in the valley floor, and by friction of the edges of the glacier on the cirque wall. In the larger glaciers in Canada, Alaska and other places, where the motion is rapid, and the glacier long, these are important causes of longitudinal crevasses. In the larger glaciers also, friction on the valley wall causes transverse crevasses.

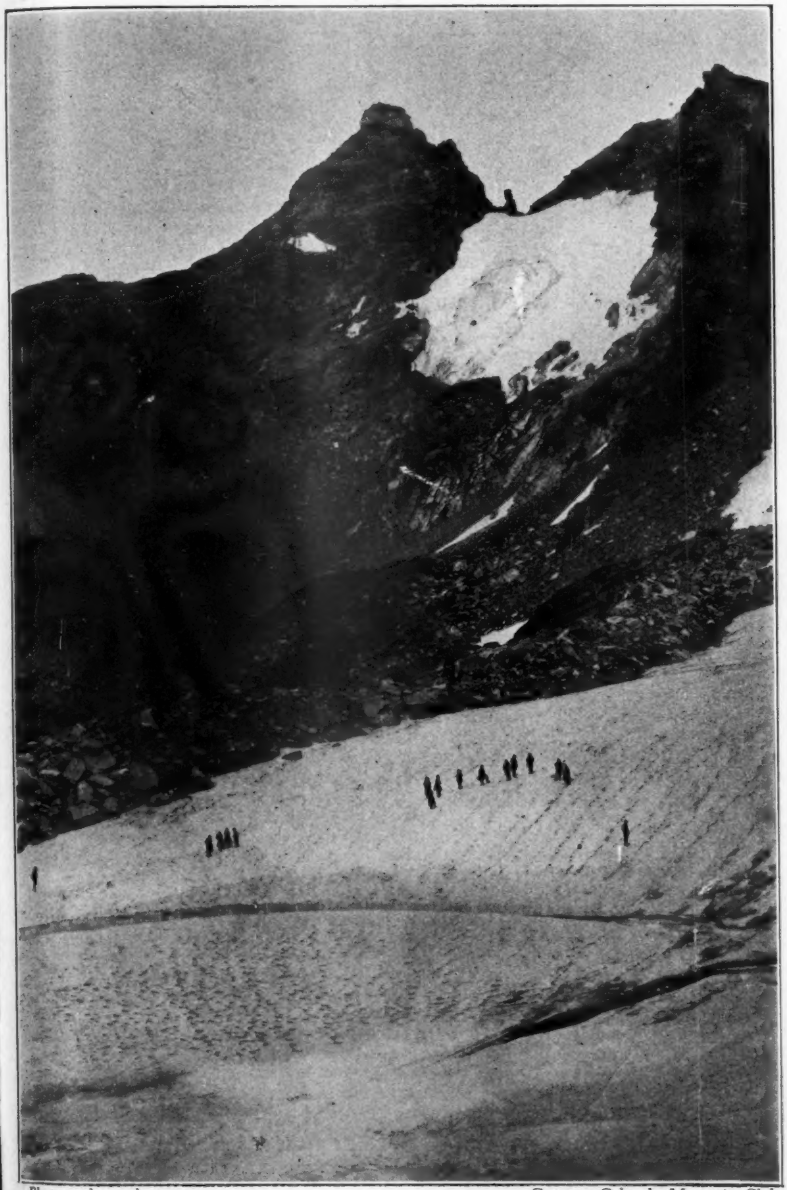
In the early fall, banding of the face of the glacier can be observed. This is believed to be due to deposition, and many authorities believe that each band represents one year. Certainly, the major bands represent a seasonal variation, with clean ice representing the major portion of the winter snow, and ice mixed with gravel and rock representing the surface melting of the warm season, with its accompanying rain of rock from the valley wall. Bands of this type can, theoretically, also be made by a thaw in the early spring, followed by a heavy snow. If this occurs, there will be two bands, instead of one, laid down in one year. On Fair Glacier, a hanging glacier a few miles from the Arapaho, more than 400 such bands were counted in about one half of the thickness of the ice. This is of twofold importance—it indicates that the glacier is of considerable age historically, and it indicates that the ice now in the glacier is not a direct survival of the pleistocene glacial period.

The rate of advance of the alpine glaciers of Colorado is in dispute. Measurements made twenty years ago indicate that the Arapaho Glacier was moving forward at the rate of 27 feet a year. More recent estimates indicate that this figure, while carefully determined, may be considerably in error, as the motion of a glacier is not uniform throughout, and varies greatly from day to day, if not from hour to hour.

One of the rare and interesting features of alpine glaciation, an ice table, was observed two years ago on the Arapaho Glacier. This is a large rock supported several feet above the main ice body by a column of snow. Ice tables are believed to be caused by the rock which forms the top falling onto the ice in late spring, and then the snow around it melting away. The snow beneath the rock is protected from the sun, and in early summer forms the column. These features are also called "toadstools." They seldom last more than a few months.

Glacial History of the Arapaho Area

Prior to the Pleistocene glaciations, the Front Range of Colorado was a



Photographer unknown *Courtesy Colorado Mountain Club*

The Navajo and Isabelle Glaciers. These two ice fields are remnants of one great glacier that extended seven miles east at the time of its greatest advance. The ice field just below the conical peak is Navajo Peak Glacier; the one on which the party is standing is Isabelle Glacier. Note moraine and morainal lake.

slightly eroded plateau, surmounted by the erosion remnants of two other plateaus. These have been called peneplains. Their elevations now are approximately 14,000 feet, 11,000 feet and 8,500 feet. They have been called respectively the Long's Peak, Flattop, and Rocky Mountain peneplains.

During the first glacial advance of which we have verifiable evidence, the glaciers removed all but a few acres of the Long's Peak peneplain, of which only a small part remained prior to ice action; cut deeply into the Flattop peneplain; and piled glacial debris and outwash onto the Rocky Mountain peneplain.

The length of Arapaho Glacier during this first advance was about nine miles; its thickness, as shown by glacial polish on the valley walls, was about 600 feet; and the width of the ice field was about one mile.

There were five heads to the glacier at that time, one to the south of the present glacier, which occupied a wide basin; the present glacier; the valley now occupied by the Henderson Glacier; the Ice Lake Valley, which now contains no glacier; and the Albion Valley, to the north, which contains at its head a perennial ice field, having some glacial features, but not having any motion which can be observed, except in certain seasons.

At Silver Lake, four miles below the névé, the Albion Glacier joined the glacier made up of the Arapaho, Henderson, and Ice Lake Glaciers, which joined two miles west of Silver Lake. Two miles downstream from Silver Lake, the southernmost branch joined the rest, and the combined glaciers went about three miles further to Lakewood, where they melted out in a basin, now called Pretty Meadow, at an altitude of 9,000 feet.

A moraine, nearly 5 miles long, blocked the mouth of the Arapaho Valley except for a narrow channel, down which the ice flowed to Pretty Meadow.

After this advance, the ice retreated long enough for the streams at 11,000 feet to cut channels several feet into the rock. Then another advance of the ice came, not as great as the first, and not as extensive. Moraines of this advance piled up on the upstream side of the moraines of the first advance, and built a great loop across the channel leading down to Pretty Meadow. The southern arm of the first advance did not join the second advance at all, but built a dam across its valley a few hundred feet above the former junction.

The retreat of the ice, after the second advance, was not steady. Recessional moraines, at various places in the valley, indicate places where the retreat paused for some time.

At some time between the beginning of the retreat and the present, the lake impounded behind the terminal moraine of the southern arm of the ice washed out its dam. The rush of water down the valley washed a gap in the main terminal moraine of the second advance, just above Pretty Meadow, and built up an outwash fan about 200 feet thick, 7,000 feet long and 2,500 feet wide in the meadow.

Enough time has elapsed since this last retreat to permit vegetation to attain its normal growth in the glaciated valleys.

Evidence for the two advances is given by the two series of moraines at the mouth of the valley, one more deeply weathered than the other; by the two lateral moraines in the Silver Lake valley; by the two outlets in the various lakes in the abandoned cirques, one now in use, the other, at a higher level, cut deeply into the rock, then filled with glacial debris; and by two sets of striae, or ice scratches, one almost weathered out, the other very slightly weathered, that are present in many places. The old striae are usually found in places that were not glaciated by the second advance.

These two advances have not been definitely correlated with the continental glaciations as yet. It is entirely possible that the advances of the alpine glaciers occurred at slightly different times than the continental advances. Lack of any good evidence of earlier glaciations if such occurred, is explained by the fact that each advance took place in the same location as the previous one, so that each advance would wipe out much of the evidence of the earlier advance.

The other glaciers in Colorado had a history very similar to the Arapaho, except that those on the western slope of the Front Range extended further

(*Photo by Carl Blaurock*) *Courtesy Colorado Mountain Club*

Crestone Needle and Peak in the Sangre de Cristo Range. This is typical glaciated mountain country, with rounded valley floors and jagged peaks. On either side of the main peak are abandoned cirques, partially filled with snow.

down their valleys than those on the eastern slope.

The future of these existing glaciers is uncertain. Some believe that they will melt away entirely, and others are just as certain that they will remain in about their present sizes and locations for many years. Studies of their fluctuations in size have not been made for a long enough period of time to find any definite trend. The glaciers appear to retreat for a few years, then advance, and later to retreat again. This year, there seems to be an advance, partially offsetting a retreat which has been observed during the last five years.

Value of the Glaciers

The existing glaciers of Colorado and other places have a great value as regulators of the runoff of the mountain streams. In a glacier-controlled stream, the runoff is great in the spring as in any other mountain stream, but it continues throughout the summer and fall, while a stream in the high country which does not have a glacier or perennial snowfield at its head is likely to dry up in the early summer. Because of this, the streams which have a glacier at their source have been used for municipal water supply in preference to others, and the valleys watered by glacial streams have better irrigation.

The outwash from the mountain glaciers has been deposited on the great plains, and is still largely unweathered and unconsolidated. Some of this material has been carried away by wind, causing dust storms. The moraines have been found to be unfit for agriculture, and by some freak of nature seem to bury rich mineral deposits in many places.

The erosion by ice in the higher valleys has uncovered a number of mineral veins, and has removed the rich oxidized zone in some places. The rocks polished by the most recent advance are not yet deeply weathered. Crystals of feldspar, showing "flow structure" can be observed in several of the valleys, where the ice cut into the batholith underlying the mountains. Landslides of great size have recently occurred in the glaciated valleys, where the ice-cut wall was steeper than the angle-of-rest of the weathered surface rock.

(Photo by Chas. F. Snow) *Courtesy Colorado Mountain Club*

The Arapaho Valley from Silver Lake. The Three small valleys near the center are:—left, the Arapaho Glacier valley and glacier; center, the Henderson Glacier valley; right, the Ice Lake valley. This entire valley was filled with ice to a depth of 600 feet during the Pleistocene advances of the Arapaho Glacier and its tributaries.

While the water derived from the glacial streams is of great importance to agriculture, the glaciers have not been an unmixed blessing to either farmer or miner.

BIBLIOGRAPHY

General:

Coleman, A. P.—"Ice Ages, Recent and Ancient," New York, 1929

Piersson and Schuchert—"Textbook of Geology," Vol. II, p. 647-663.

Rocky Mountain:

Henderson, Junius—"Extinct and Existing Glaciers of Colorado" University of Colorado Studies, Vol. VIII No. 1, 1910. (This, the most accurate work on the subject, is now out of date and incomplete, due to numerous recent discoveries).

Fenneman, N. M.—"The Arapaho Glacier"—Journal of Geology, Vol. 10, p. 839-51.

Map:

U. S. G. S. Quad Map. "Rocky Mountain National Park" .(Arapaho Glacier is in N.W.¼ of section 26, T 1 N, R 74 W).

Beryl and Scheelite Associated Together

By WALTER S. PALMER

Director State Analytical Mining Laboratory University of Nevada, Reno, Nevada.

On May 12, 1930 there was received at the Nevada State Analytical Mining Laboratory the first specimen of beryl which had ever been reported as being found in Nevada. This specimen came from the Humboldt Range which runs in a southerly direction from Imlay, a division point on the Southern Pacific Railroad, about 140 miles east of Reno.

This specimen proved of considerable interest because it had been stated by geologists very familiar with Nevada geology that beryl would not be found in Nevada because of the type of formations found over most of the state. It also proved of interest because it is as far as known, the first occurrence which has been noted, of the association of the minerals beryl and scheelite.

In February, 1931, another specimen of the same character was sent to the Laboratory. If attempts were made at this time to find a workable deposit they were not successful because nothing more was heard of the occurrence until the spring of 1934. At this time specimens containing very distinct, light green crystals of beryl were sent to the Laboratory for identification, as to their being beryl. Remembering the previous specimens from this section of the state, tests were made on the specimens for tungsten and some scheelite was found, The party sending the specimens was advised to look for scheelite since it was more valuable than beryl. Within two weeks the same party found float pieces of solid scheelite and later found a dike from which almost pure specimens of scheelite were taken.

The deposit consists of what may be called a pegmatite vein on the contact of limestone and schist. The principal minerals are large crystals of white quartz and feldspar together with some mica, beryl, scheelite, fluorite and calcite. It has been traced on the surface for over 1000 feet. It varies in width up to a foot or more. Some 40% tungsten ore has been sorted and shipped. The deposit promises to become a valuable tungsten deposit. At the present time it is doubtful whether the beryl can be saved as a byproduct after recovering the scheelite.

Gold At Camp Smith, New York*

By PETER ZODAC, *Editor "Rocks and Minerals"*

When Cammack made that fatal swat on a dark outcropping rock and broke off particles of a yellowish metal, he certainly started something. Since that time all you can hear around Peekskill is: "There's gold at Camp Smith!" And it was gold—the real thing but—only in small quantity.

Just how did this all occur? It was the morning of Monday, July 22, 1935, that three painters, William Cammack of Annsville and Robert Taylor and George Blake of Peekskill, were painting the Ordnance Building at Camp Smith. About 11:50 A. M., in shifting a ladder they were using, a spot was reached where the ladder would not stand up firmly and Taylor suggested to Cammack that a small board be placed under one end in order to level it. Finding a board, Cammack sought to shorten its length by hitting it over a nearby outcropping rock. The board was shortened but in the process pieces of rock were knocked off containing small yellow specks which glittered in the sunlight suspiciously like that of gold. Cammack called Taylor's attention to it; both then called Blake. Blake, an amateur mineralogist, pronounced it gold. The two men were skeptical, said it was pyrites (fool's gold) and began to deride him.

"You're crazy," chided Cammack.

"You're crazy as a nut," echoed Taylor. "The weather has been too hot for you."

"It is gold," insisted Blake.

"Prove it," retorted the others.

"All right, we will take it over to ROCKS and MINERALS office and I'll bet you a nickel to a hole in a doughnut Peter Zodac, will say it's gold."

"Gee," said Cammack, as he saw a fine limousine go by, "if that's gold, I'll soon be riding in one of those cars."

Two small specimens were brought over to ROCKS and MINERALS office and Blake's statement was verified. It was gold. The gold consisted of minute flakes in milky quartz.

In spite of the gold strike at Camp Smith, there has been no resultant rush of prospectors to the locality. The Military Police would undoubtedly have checked such a stampede at the beginning. For any one appearing at Camp with a pick or shovel, would have been told very promptly where he could dig, and it wouldn't have been at Camp Smith either.

The first enthusiasm occasioned by the discovery has apparently died out. Even the three painters who found the specimens of the glittering metal seem apathetic over a prospect of securing wealth in this vicinity, except as it may be earned with their paint pots and brushes. A very serious obstacle to further investigation also lies in the location of the rock from which the specimens came. It is in the lawn in rear of Maj. Gen. W. H. Hay's residence, situated a few hundred feet north of the main military camp, and no one has as yet been found who would have the timerity to stick pick or shovel in that well trimmed sod. Nevertheless, the fact that gold has been discovered in the mountains of the Hudson Highlands, is not without its importance.

Many prospectors have vainly wandered over these hills and mountains, searching for gold, or the lost Benson mine. But no one ever found either. The Benson mine was silver, and legend has it that Benson, an Englishman, who never disclosed its location, took untold wealth from it, doing his own smelting, and taking the silver to town, in a market basket, in bright pure bars.

Any old map of Westchester or Putnam Counties, New York, will show the location of many a gold and silver mine (Camp Smith is in the northwestern part of Westchester County and about two miles south of Putnam County). State records will show patents issued to discoverers of these metals. A patent was issued to work a silver mine on Central Avenue in Peekskill, years ago, but Cammack, Taylor and Blake are the only real discoverers of gold. And they were not looking for it; only at-

*Camp Smith is the chief encampment for the New York National Guard.

tempting to break a wooden board to level up a ladder.

But enthusiasm still burns in the bosom of the writer. It was to him Cammack, Taylor and Blake repaired after making their strike, to find out if it really was gold they had found. The writer was quite as excited as they were, but for other reasons. He has been compiling all the information he could gather on minerals and mineral localities in Westchester and Putnam Counties. He has investigated many old workings—mine, pit or mere prospect hole, he has heard of, and has found some that nobody now living remembered anything about. Some day he is going to print articles about these mines and minerals in ROCKS and MINERALS, and perhaps afterward gather them together in a book. And now here is something entirely new, to write about, an occurrence of gold in a territory where it wasn't supposed to exist..

In spite of the covering foliage, so luxuriant at this season of the year, the writer went into the field to make a survey. He wasn't looking for a bononza mine, or any considerable deposit of gold, but he did want to assure himself that there was more of it in the hills and mountains. The officers at Camp Smith were only too ready to give him a pass to go over the reservation, and the first place he visited was Gen. Hay's lawn. He looked it over,—that is the rock in which the strike was made. He measured it and found it 3 x 3 feet and one foot above the lawn. The top was rounded over, and many a person had sat upon it without realizing they were occupying what might be regarded as a golden seat. Upon examination he found it to be a dark hornblende gneiss, containing the quartz vein which had carried the gold. This vein was about ¾" wide and about 3 inches long. It was imbedded in a small feldspar dike which ran through the rock's center, but none of the quartz exists in the rock now. So far as could be ascertained the rock was evidently a boulder or detached mass from a ledge located two miles further to the north. Its appearance did not justify a belief in it having traveled any greater distance.

From this rock as a starting point, the writer proceeded northward 2,000 feet, to the corral, where the military animals are quartered—the horses and mules the army still has use for. Here he found three pits The first and largest is directly opposite the entrance to the corral, at the junction of McCoy and North Camp Roads. The pit is on the east side and adjacent to the road. This pit was 50 feet in diameter and originally 50 feet deep, but has been used as a dumping ground and is now filled with refuse and dirt. It is in limestone and had been worked as a gold mine for a New York City company. This information he obtained from Jack Head who has a small shack in the woods about a mile north of the pit. Jack said he had worked as water boy there 60 years ago. Lew Williams was the boss of the six miners employed and was said to have discovered the ore body. The mine was worked during the open seasons over a period of two years, and the rock taken out was put in barrels, carted to Peekskill, and shipped to New York. Everything taken out of the pit has been carried away, and nothing can be found in the surface rock which gives any evidence of the presence of gold.

About 600 feet beyond this pit, and due north, he found a vertical shaft 10 x 8 feet in area near the top of a small hill. The present depth of this shaft is 22 feet. The original depth was probably 50 feet, as it too has been generally used for the disposal of rubbish. It was sunk probably a hundred years ago through a crushed zone of granite in search for gold. This shaft is known to the writer as the McCoy gold mine. Jack Head did not recall ever seeing the mine worked, but remembered his father telling him it was abandoned because water broke through into the shaft and drowned the miner's tools. The shaft is 200 feet west of the wood yard in a section known as North Camp.

About 50 feet south of the wood yard and 30 feet east of the North Camp Road, the writer found the third pit 10 x 16 by 6 feet, which did not seem to be of much importance or to have had much work expanded upon it. It had been sunk in a continuation of the limestone deposit in which the first pit was sunk. This bed of limestone seems to have attracted much attention, for about three-quarters of a mile north of Pit No. 3, on the Willis Jamison property, three small pits were also sunk in

it for gold. The limestone bed runs from Camp Smith for at least a mile, and under a small body of water known as Wallace Pond, without apparently any outcrop.

The writer, however, is not discouraged that more traces of gold were not found. Over on Anthony's Nose, about two miles to the north, there is an old mine, locally known as the "copper mine." It is really a pyrrhotite, or magnetic iron pyrites mine, and was worked many years ago for its sulphur; the sulphur being burned out down the river at Highlands (now Manitou) Station on the New York Central Railroad, and used by a chemical company there for the manufacture of sulphuric acid. Around this mine there is a dark hornblende gneiss, technically known as monzonite gneiss, which may be the same character of rock as that rock in which the gold was found at Camp Smith as both are of the same texture and color. This gneiss extends in an easterly-westerly direction for several miles. This pyrrhotite mine and its associated rocks and minerals have been described by the writer in the June, 1933, issue of ROCKS and MINERALS.[1]

The writer hopes to find further traces of gold through the region in the fall, but he does not think it will ever be discovered in sufficient quantities to warrant mining. However, if other occurrences of gold are discovered here, it will be splendid grist for his literary mill. And that is what he is looking for.

1. Zodac, Peter. *The Anthony's Nose Pyrrhotite Mine.* ROCKS and MINERALS, June, 1933, Vol. 8, No. 2, Whole No. 28, pp. 61-76.

A Mineralogical Excursion

By W. H. MORSE

About two years ago a 1500 mile overland trip from Bennet, Nebraska to Senic, South Dakota, was taken by a party consisting of H. Bratt, Sr., Professor and Mrs. C. Bratt, Harold Frinke and the writer. Our first stop of importance on this journey was at Agate, Nebraska, where we found a Post Office and a large ranch house owned by the Cook Brothers. We were surprised to find here a first class museum with a large collection of valuable precious and semi-precious stones. Old firearms were everywhere, and the rarest of Indian dresses, pre-historic bones and many other curios. It seemed like jewels in a wilderness. Mr. James Cook is the author of the book, "Fifty years on the Old Frontier" published by the Yale University Press. We asked him if we could collect some agates and his answer was, "See that hill, there are plenty of agates there and you can help yourselves." We went to the locality designated and for the first time I saw agates in vein form. The vein contained about 8 inches of the finest moss agate, running along the face of the hill. After some struggling with the capping, our sacks began to get heavy and we headed for camp.

Upon reaching Hot Springs, South Dakota, the next day, we were surprised to find white chalcedony everywhere, but too much civilization. We left for Rapid City, seat of the State School of Mines, where we visited the School's geological museum. Here we were among the remains of ancient animals that had roamed over the plains one hundred million years ago. Rocks and minerals were also well represented; a wonderfully banded agate caught my eye while the crystals and cut gems proved so fascinating we

hated to leave. Following this visit to the museum we were guided by a boy to a canyon where petrified wood was in abundance. Large trunks of trees that had been turned to stone were scattered all around.

We now made for Senic, a small village at the edge of the Bad Lands. We passed Crawford. Here the pillars at the entrance to the Park were studded with semi-precious stones, pieces of jasper of different colors, agates and other quartz minerals, and a yellow semi-transparent one that I had not seen before. The sun was shining on them and the effect was beautiful.

We came to a small town, the name of which I cannot recall. Here they had built an arch with a recess in it. We spent a little time examining the stones that were studded all over the arch. There were several I did not know but their base seemed to be quartzine; the coloring was extensive. Beautiful rose quartz were plentiful and large pieces of agate and chalcedony.

We finally arrived at Senic, on the edge of the Bad Lands. These lands are not misnamed. The soil is a peculiar thick yellowish clay, which is even worse when wet. We started down the Yellow River. My companions were gathering fossils and prehistoric bones and I was collecting rocks, so each one went his own way. I soon found some crystals; some were steel blue, like the finest diamonds; others would pass for topaz. The farther I went away from the dirty poisonous water and into the hills, the better the crystals seemed to be. Soon I stood with astonishment—everything seemed worth gathering but my sack was getting heavy and I had to confine myself to the best obtainable. I then began to retrace my steps as I was perspiring freely; I had from fifty to seventy pounds of minerals in my sack, besides the tools. I had re-entered the dry creek up which I came when I heard the distinct sound of a hammer. On turning the next bend, I came upon the Professor swinging a twelve pound spalding hammer on a large boulder. "What are you doing," I shouted. "Come and see this fine ammonite! This one is worth sweating for!" Just as he got it out, his father came up loaded with bones of every description and we then headed for Camp, very proud of our day's finds.

The next morning it rained and we stayed in camp but later it cleared and we were off again. Harold landed a Baculite in a rock concretion. This fish has rarely been found entire, but the beauty of its skin is perfect. I stayed in Camp while my companions hunted fossil turtles. On the morrow we were to head for home, but bright and early we were off to gather the turtles they had located. It fell to Harold's luck to get the largest and most perfect specimen. The Professor came next with a perfect one but much smaller. Mrs Bratt found a perfect lower jaw with teeth intact of some prehistoric animal. I was successful in finding two large pieces of agate, one sky-blue and the other mottled, showing ice scars and weighing fifteen pounds or more, each. These, together with the piece of agatized timber weighing about forty pounds (a beautiful perfect piece), made me feel very happy, but time was getting short so we headed for home, tired and worn out but arranging for a month's trip in the near future.

Three Interesting Minerals of Adams Co., Pa.

By R. G. MARTIN

In the pre-cambrian lavas of Adams County, Penn., fine specimens of native copper, in quartz and in green basalt, have been found.

In the same locality fine specimens of orange-red cuprite, associated with native copper, and copper carbonates, also occur. This material is found in a dense, amygdaloidal rhyolite and takes a fine polish.

Another mineral in the same locality, of interest to collectors, is the rare piedmontite. It consists of dark red radiating crystals, filling and covering a light purple rhyolite. Some exceptionally fine specimens of piedmontite have been found recently.

Cosmopolitan Specimens

By PETER ZODAC, *Editor Rocks and Minerals*

In the June, 1935, issue of ROCKS and MINERALS, the writer described a specimen of granite, 2" x 3" in size, weighing 6 ounces and containing ten different minerals.[1] The granite specimen was not at all attractive but it was interesting because of the large number of minerals it contained. A request for readers to submit notes on specimens which could match or exceed the number of minerals in the particular granite mentioned, brought forth only one response. Mr. James F. Morton, Curator of the Paterson Museum, Paterson, N. J., sent us the following:

"Yes, I can match your ten-species specimens, though not surpass it. I have a specimen from Paterson which exhibits the following minerals, all macroscopic and plainly visible to the naked eye; Albite, Babingtonite, Calcite, Chalcedony, Chlorite, Chrysocolla, Datolite, Hematite, Prehnite, and Stilbite. It is not a large specimen, being about 2" x 3" in size, and is quite unattractive, looking like something the cat dragged in, but the minerals are all there."

On July 20, 1934, the writer had collected a number of specimens from large broken up slabs, at the northern face of a clay bank bordering the entrance to Camp Smith, near Peekskill. The bank was being excavated for filling in an adjacent swamp to make a parking space for the Camp. About a month ago, in examining the material collected, one specimen of hornblende gneiss was noted which contained ten minerals. The specimen is 2½" by 2½" in size and weighs 5 ozs. The minerals it contains are Epidote, Hornblende, Hyalite, Leucoxene, Limonite, Microcline, Molybdenite, Pyrite, Quartz and Titanite.

If any reader can exceed the number of minerals mentioned in one of the above specimens will he kindly drop a line to ROCKS and MINERALS **describing what he has?** Remember this is not to be a microscopic examination but only such as can be made with the ordinary magnifying glass and the specimen must not exceed 3" x 3" in size.

1 Zodac, Peter—"A Cosmopolitan Specimen," Rocks and Minerals, June, 1935, p. 91.

Club and Society Notes

Idaho Gem Club—Boise Chapter

A group of gem lovers, in the State of Idaho, recently got together and organized the Idaho Gem Club. It was called the Gem Club to jibe with Jem State by which Idaho is known. F. G. Pickett, Jr. a lapidarist of skill, was elected President; H. D. Eslick, Secretary and Treasurer, and John T. Carpenter, Field Trip Captain. The club has a membership of 18.

A number of members have installed lapidary machines and are cutting and polishing many of the gemmy minerals for which Idaho is noted.

The club invites correspondence and will exchange specimens with collectors in other localities. For further information write. Harry D. Eslick, Secretary and Treasurer, 602 Washington St., Boise, Idaho.

New Haven Mineral Club

A number of field trips for the summer have been arranged and members and their friends are urged to attend each and every one of them. The next one will be Sunday, Sept. 15th, Feldspar Quarries, White Rocks, Middletown, Conn.

Members will meet at 9:00 A. M. (D. S. T.) at Peabody Museum, New Haven, Conn., at the quarries at 10:00 A. M. (D. S. T.). Those having cars with room for an extra passenger or two, are requested to pick up members.

Subsequent trips will be listed in ROCKS and MINERALS.

THE AMATEUR LAPIDARY

Conducted by J. H. HOWARD*

504 Crescent Ave., Greenville, S. C.

Amateur and professional lapidaries are cordially invited to submit contributions and so make this department of interest to all.

*Author of—*The Working of Semi-Precious Stones.* A practical guide-book written in non-technical language for those who desire to cut and polish semi-precious stones.

But—Where Was It?

"I saw somewhere an article on the chemistry of the Agate, but where was it?" Haven't you had this experience over and over? My memory for such things is very poor but most of the long and often fruitless searches are now of the past. I open my index volume and find "Agate—Jelly Chemistry of — Rocks and Minerals — Dec, 1928."

It cost me $2.50 and a few pleasant and interesting evenings to bind and index all the mineralogical magazines that were scattered from cellar to garret. The Ten Cent Stores have stiff backed looseleaf ring binders at prices of from Ten to Twenty cents and of varying sizes. It took twelve of the Twenty cent size to bind all issues of ROCKS and MINERALS, The OREGON MINERALOGIST, GEMMOLOGY, etc., and leave one volume for the index and one for future use. The paper punches at the Ten Cent Store are probably not strong enough to perforate these magazines (though I have not tried them) but it is easy to make a suitable punch of a piece of small pipe or an iron bolt or rod. The papers to be perforated are laid on the end of a heavy wood block and the punch driven through them with a heavy blow of a hammer.

Set up all issues of a given magazine chronologically. For working paper use a pad of cheap paper such as a scratch pad. Assign two or three pages to each letter of the alphabet. Then beginning at the earliest issue of the magazine, scan each article. If a particular one is likely to ever be wanted describe briefly what it is, the magazine in which it appears and the date of the magazine. After all issues have been scanned and the desired entries made in the scratch pad, copy the entries, preferably with typewriter, on the loose leaves of the index volume, leaving plenty of space after each entry for future closely related entries.

In making up the volumes do not crowd the binders. They cost very little and crowded ones are hard to handle.

Get a roll of opaque cloth mending tape. Type or print the title of each volume where the title of a book is supposed to be, so that each volume can be identified without drawing it from the shelf. Example "ROCKS and MINERALS—Dec. 1926—Sept. 1928."

One of the looseleaf volumes is an admirable place to file clippings. Make it a regular Scrap Book and refer to each of its clippings by pages in the main index.

In making the index it is not necessary to confine the entries to the volumes of looseleaf books nor even to books in your possession. If you find any article of interest in any book, anywhere, it is well to index it so that it may be referred to when needed.

J. H. Howard

Personal Greetings

We are always pleased to meet our friends when they are traveling this way. Among those who called on us recently were:

Jacob Bob, Brooklyn, N. Y.
Mr. and Mrs. I. D. Clark, Brentwood, Md.
Dr. and Mrs. H. C. Dake, Portland, Ore.
Pauline Feferholz, Brooklyn, N. Y.
J. K. Fisher, Upper Darby, Penn.
Evelyn Glantz, Brooklyn, N. Y.
Roy Haworth, Upper Darby, Penn.
John Allen Higgs, Boston, Mass.
Mr. and Mrs. Carl Klein, Hudson, N. Y.
Walter S. Mayer, Beaver, Penn.
Henry E. Millson, Philadelphia, Penn.
John Ryan, Torrington, Conn.
Edward Schneider, Woodhaven, N.Y.
Frederick Schneider, Woodhaven, N. Y.
D. D. Stevens, Castle Point, N. Y.
Dr. and Mrs. Hershey Thomas, Philadelphia, Penn.
Helen Wright, Castle Point, N. Y.

Acknowledgments

We wish to acknowledge receipt and express our sincere thanks for specimens and other donations recently sent us by some of our subscribers.

English, A. A., Mobile, Ala., a nice specimen of bauxite from Arkansas.

Kitson, John, Easthampton, Mass., a number of fine specimens of babingtonite, from a locality near his city.

Klein, Carl, Hudson, N. Y., A Hudson Sesquicentennial Half Dollar. This coin was recently issued by the government to commemorate the 150th anniversary of the incorporation of Hudson, N. Y., as a city.

Martin, R. G., Waynesboro, Penn., three interesting piedmontite specimens from his locality.

Bibliographical Notes

Catalogue of Mineral Pseudomorphs in the American Museum: By Clifford Frondel. Bulletin of the American Museum of Natural History, New York, Vol. LXVII, 1935, Article IX, Feb. 26, 1935, pp. 389-426.

An interesting list of mineral pseudomorphs with their localities and often accompanied by a brief description of the specimens that are on display in the American Museum of Natural History.

A Study of the Bayport Chert: By Fred Dustin. (Reprinted from Papers of the Michigan Academy of Science, Arts and Letters, Vol. XX, 1934. Published 1935) pp. 465-475.

During the author's 25 years experience in collecting Indian relics from his native State of Michigan, he soon observed that nearly all of the material collected, was of a characteristic mineral in which the lines of growth or depost were concentric; the material was chert. From this it was but a step to the study of the chert and to the wider field of its geologcal genesis and distribution.

The chert described in the paper is that found in the limestone which is most prominently exposed near Bayport in Huron County and in Arenac County, or on islands in Saginaw Bay.

Lead and Zinc Mining and Milling in the United States: Current Practices and Costs: By Chas. F. Jackson, John B. Knaebel and C. A. Wright. Issued by the U. S. Bureau of Mines, Washington, D. C. at Bulletin 381, 204 pages, 59 illus.

A feature in the bulletin which is of importance to mineral collectors is a list of 80 minerals, occurring in lead and zinc deposits. The composition of each mineral followed by a brief remark is also included.

A copy of the bulletin may be obtained from the Superintendent of Documents, Washington, D. C. Price 15c.

Annual Report of the Quebec Bureau of Mines for the Calender Year 1933: Part C—*McWatters Mine gold belt, East Rouyn and Joannes*, by J. E. Hawley and *Beattie-Galatea Mines map-area*, Duparquet township, by J. J. O'Neill; 114 pages, 4 maps, 9 fig., 4 plates. Issued by the Bureau of Mines, Province of Quebec, Quebec, Canada.

Minerals of New Jersey: This is the title of an interesting little four page price-list of New Jersey minerals on sale by the New Jersey Mineral Exchange, 25 Hamilton St., Paterson, N. J. Copies are free and one should be in the hands of every mineral collector. Send for your copy TODAY!